

REMARKS

Applicants respectfully request consideration of the subject application. Claims 1-5, 7, 9-13, 15-23, 25-29, 31-35, 42-43, 45 and 46 are pending. This Response is submitted in response to the Office Action mailed March 3, 2006. In this Amendment, claims 1 and 42 have been amended. No new matter has been added.

Objections to the Drawings

The drawings have been objected to under 37 C.F.R. 1.83(a). In particular, the Office Action states that the feature, "the means for positioning said electronic or electrical device proximate a conduit having a flexible channel attached thereto" of claims 42, 43, 45, and 46 are not shown in the drawings.

Applicant has amended claim 42 to remove the above limitation. As such, Applicant respectfully requests removal of the objection to the drawings.

Rejections Under 35 U.S.C. 112

Claims 42 – 43 and 45 – 46 have been rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. In particular, the Office Action states that the specification or drawings do not provide support for the structural limitation, "the means for positioning said electronic or electrical device proximate a conduit having a flexible channel attached thereto."

As noted above, Applicant has amended claim 42 to remove the above limitation. As such, Applicant respectfully requests removal of the rejection under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

Rejections Under 35 U.S.C. §§ 102 and 103

Claims 1 - 2, 5, 11 - 12, 15 - 16, 18 - 22, 25, 42, and 45 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Downing. Claims 4, 7, 9-10, 13, 17, 26-28, 43 and 46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Downing. Claims 1 - 3, 7, 10 - 11, 16, 18 - 19, 21 - 23, 29 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto, in view of Downing.

Applicant respectfully submits the cited art fails to teach or suggest, inter alia, as claimed in claim 1: "a flexible channel to alternate between a compressed position and an extended position and having a first open end and a second closed end, said first open end coupled with said conduit, said open end having an internal width, said flexible channel comprised of a resilient material having spring-like characteristics, said material to provide a spring-like restoring force when compressed, the second closed end comprising a thermally conductive material attached to said flexible channel, said thermally conductive material having a substantially planar surface to interface directly with said integrated circuit when said flexible channel is extended and to detach from said integrated

circuit in said compressed position, said flexible channel being conformable with a non-planar integrated circuit." A similar limitation is included in independent claim 42.

Downing is directed to a coolant-activated high-intensity cooler for cooling electronic modules. Downing discloses hollow resilient members mounted at the open end of a coolant chamber and having bellows and a heat transfer piece mounted at the ends of the bellows so as to be in direct and resilient contact with electronic components. Downing also discloses a laminated stack of plates arranged with a metal bellows. Downing further discloses that fluid coolant flows through the stack and the metal bellows expand when the coolant is initially pressurized to move the cooler assembly into contact with the electronic module which acts as the heat source. When the coolant circuit is depressurized, the spring constant in the bellows will cause the assembly to retract from the module allowing servicing or replacement.

Downing does not teach or suggest a flexible channel being conformable with a non-planar integrated circuit. Downing discloses that the thermally conductive interface elastomer material interfaces between the bellows and the module so that any surface irregularities on the module or misalignment between the assembly and module are accommodated without impeding the transfer of heat.

In contrast, in embodiments of the presently claimed invention, the flexible channel is made of a sufficiently resilient material to allow the flexible channel to be conformable with non-planar integrated circuits.

Yamamoto is directed to a cooling system which includes a cooling module which has a heat transfer plate that is exposed to a flow of coolant and is elastically biased toward a circuit component on a printed circuit board for transferring heat dissipated by the component to the coolant. A series of projections are provided on the heat transfer plate for producing turbulence in the flow of coolant.

Yamamoto also does not teach or suggest a flexible channel being conformable with a non-planar integrated circuit. Yamamoto discloses that in order to avoid incomplete surface contact between the heat transfer plates and circuit components, the thermal sheet is replaced by solder material, such that the heat transfer plate adheres directly to the circuit component in a compliant or rigid contact manner. See, for example, col. 2, lines 3-17 of Yamamoto.

Moreover, Applicant respectfully submits there is no motivation to combine Downing and Yamamoto to arrive at the presently claimed invention. It would be impermissible hindsight, based on applicants' own disclosure, to combine Downing and Yamamoto. In particular, Yamamoto teaches away from "a flexible channel to alternate between a compressed position and an extended

position and having a first open end and a second closed end, said first open end coupled with said conduit, said open end having an internal width, said flexible channel comprised of a resilient material having spring-like characteristics, said material to provide a spring-like restoring force when compressed, the second closed end comprising a thermally conductive material attached to said flexible channel, said thermally conductive material having a substantially planar surface to interface directly with said integrated circuit when said flexible channel is extended and to detach from said integrated circuit in said compressed position, said flexible channel being conformable with a non-planar integrated circuit..."

As described above, Yamamoto discloses that the heat transfer plate adheres directly to the circuit component in a compliant or rigid contact manner so that substantially complete surface contact therebetween is achieved regardless of any surface evenness of the contacting surfaces. Thus, Yamamoto clearly teaches away from a flexible channel which has extended position, in which the thermally conductive material interfaces the IC, and a compressed position, in which the thermally conductive material detaches from the IC.

In contrast, Downing discloses moving the cooling device towards and away from the electronics module by activation of a coolant pressure so that the electronics package can be removed when the fluid circuit has been depressurized.

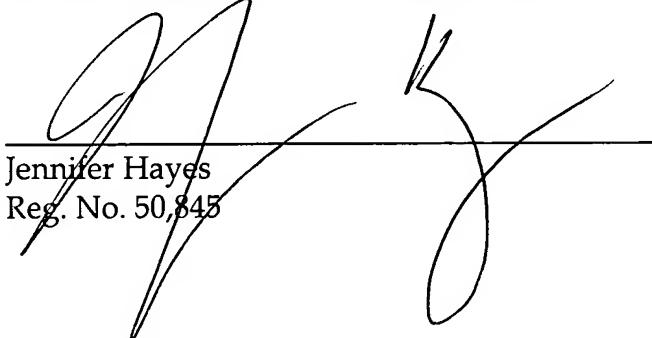
Therefore, neither Yamamoto, nor Downing, nor combinations thereof disclose or suggest the claimed limitations of independent claims 1 and 42. Claims 2-5, 7, 9-13, 15-23, 25-29, 31-35, 43, 45 and 46 depend, directly or indirectly, from one of the foregoing independent claims. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1-5, 7, 9-13, 15-23, 25-29, 31-35, 42-43, 45 and 46 under 35 U.S.C. §§ 102(b) and 103(a). Applicants submit that all pending claims are in condition for allowance.

Applicant respectfully submits that the present application is in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call Jennifer Hayes at (408) 720-8300.

Please charge any shortages and credit any overages to Deposit Account No. 02-2666. Any necessary extension of time for response not already requested is hereby requested. Please charge any corresponding fee to Deposit Account No. 02-2666.

Respectfully submitted,

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Dated: June 5, 2006

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